

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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JUL 11 2008

IN THE APPLICATION OF:

ROGER MOONS

CASE AD6883USNA
NO.:

APPLICATION NO.: 10/627902

GROUP ART UNIT: 1761

FILED: JULY 25, 2003

EXAMINER: DREW E. BECKER
CONFIRMATION NO.: 3469

FOR: IMPROVED THERMOPLASTIC POLYMERIC OVENWARE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. 1.132

1. I obtained a B.S. in Chemistry from the Polytechnic Institute of Brooklyn in 1962 and a Ph.D. in Organic Chemistry from the University of California at Davis in 1967.
2. I am currently receiving a pension from the assignee of this application E.I. DuPont de Nemours & Co., Inc. (hereinafter DuPont).
3. I am a Registered Patent Agent (No. 33,852).
4. I am currently a consultant for DuPont on technical and patent matters.
5. While consulting for DuPont I directed an experiment as set forth below.
6. A composition containing 55 weight percent of Zenite® 6000 Liquid Crystalline Polymer (available from E. I. DuPont de Nemours & Co., Inc., Wilmington, DE 19998 USA), 37 weight percent talc, and 8 weight percent carbon fiber was prepared by melt mixing in a 30 mm Werner & Pfleiderer twin screw extruder. The techniques used to prepare this composition were similar to those commonly used to prepare other compositions containing LCPs.
7. The above composition was molded in a 6 oz. HPM injection molding machine into 4 inch diameter disks.

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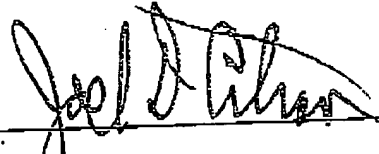
Application No.: 10/627902
Docket No.: AD6883USNA

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Page 2

8. An above described disk (after machining) was tested for through plane thermal conductivity. The resulting value was $0.368 \text{ W/m}^2\text{K}$.

9. The attached pages from Electronic Research Notebooks D100052 and D100008 describe this experiment and the conditions used for the various operations. The sample number for the above described composition was 13-1. The composition of sample 13-2 has been blanked out from the page, and the results for the thermal conductivity of this sample have been omitted.


Joel D. Citron

Date: Mon 2, 2007

T:\Patent Documents\Eng. Polymers\AD-68xx\AD6883\AD6883 Declaration of Joel Citron.doc



DuPont Electronic Laboratory Notebook

Identification Number : D100052-28.01

Experiment Name : D100052-13

Program Name : Zenite

Project Name:Thermoconductivity for Joel Citron

Document Name : D100052-13 series Thermal Conductive Zenite Joel Citron.pdf

Site Name : EEP ST

Business Unit :Engineering Polymers

Author Name : Mike J. Molitor

Date : 02/26/2007 14:59:57

Co-Author Details :

Witness Name : Adcock, Dave

Date : 02/26/2007 15:03:04

Date (GMT)	Signed by
2/26/2007 07:59:57 PM	Name: Mike J. Molitor Pre-Sig Hash: 9b9c723fedbb8ec913753be9ae4abc415c4f0fa1
Justification	By entering your password you verify that you planned and/or executed the work, directed the work, analyzed the result, or drew the conclusions described within this document.

2/26/2007 08:03:05 PM	Name: Adcock, Dave Pre-Sig Hash: 4004778267da1f14ead9d10dd217ba30817d5b91
Justification	By entering your password you will be signing to say that you have witnessed the information contained in this document

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Justification	

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BOOK PAGE E. I. du Pont de Nemours and Company

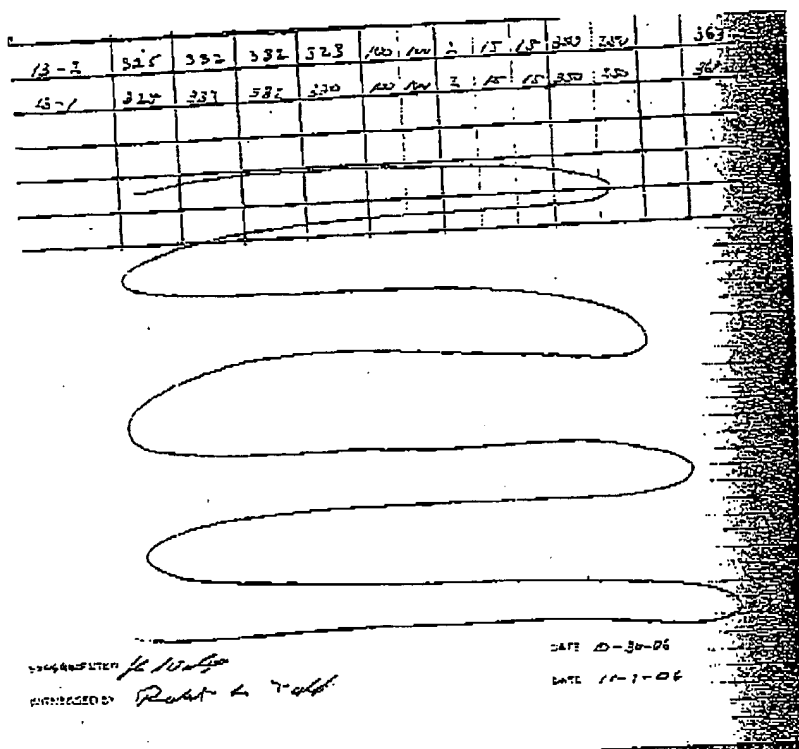
REF 602A INJECTION MOLDING DATE 10-50

E 111563- 36 PURPOSE RURAL TESTAC

FR NO. 375	RE NO. 2	NOV 52	DATE 10-50-52	CYLINDER E 02 A
FOR ANALYSIS			CHARGESSU 5.6	RAM SPEED 8417
POLYMER TYPE 40415			SCREW C.P.	BORON 1000 - 200
WOLD 2 4041 (E-F)			NOZZLE E 224	BACK PRESS 1000

SAMPLE NO.	REAR	CENTER	FRONT	NOZZLE	MOLD TEMP A B C	CYCLE		PRESS DROST IN	PLST	OTHER REMARKS
						A	H			
107	305	332	332	323	100 100	2	15 15	300	250	500

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DuPont Electronic Laboratory Notebook

Identification Number : D100008 32.03

Experiment Name : D100008-18

Program Name : Zenite

Project Name: Thermal Conductivity

Document Name : ThermalConductivityofD100052-12-1and13-2.pdf

Site Name : EXP ST

Business Unit : Engineering Polymers

Author Name : Adcock, Dave

Date : 02/26/2007 12:57:03

Co-Author Details :

Witness Name : Harvey, Pat A.

Date : 02/26/2007 12:07:04

2/26/2007 05:57:03 PM	Name: Adcock, Dave Pre-Sig Hash: 0a580a2d15133010c9e3107d413b0a33e13794 By entering your password you verify that you planned and/or executed the work, directed the work, analyzed the result, or drew the conclusions described within this document.
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2/26/2007 06:07:04 PM	Name: Harvey, Pat A. Pre-Sig Hash: 73b0cadeclbdebf8234bdc64d81ae2e301af81ba By entering your password you will be signing to say that you have witnessed the information contained in this document
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TEST DESCRIPTION

13-1

Injection molded disc

SAMPLE ID : 13-1
SAMPLE THICKNESS : 3.030mm

Average sample temperature = 30 C Controller = 30 C

TU (C)	TC (C)	TL (C)	TH (C)	TU-TL (C)	Q	RATIO
50.0	45.2	40.4	30.0	19.64	9472.1	0.21266
50.5	45.0	40.5	29.5	19.75	10096.7	0.195557
50.5	45.1	40.5	29.5	19.73	10107.1	0.195156

Average sample temperature = 35 C Controller = 35 C

TU (C)	TC (C)	TL (C)	TH (C)	TU-TL (C)	Q	RATIO
75.1	65.5	53.4	49.2	19.74	8354.4	0.233231
85.2	72.0	55.6	54.7	19.63	10161.7	0.198207
85.2	72.0	55.6	54.7	19.62	10157.3	0.198013

=====

USING CALCULATION FILE: ESI04200.ces USING FIRST ORDER FIT

USING TEST FILE : 13-1.txt

SAMPLE ID : 13-1
SAMPLE THICKNESS : 3.030mm
CTE : 0.00024000

=====

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: $2.551347e-001$ W/mK
AND A THERMAL RESISTANCE OF: $2.295308e-003$ m²K/W
AT A TEMPERATURE OF: 30.78 C

0.365 W/mK

THE DELTA T THROUGH THE SAMPLE IS : 19.73 C
THE HEATER TEMPERATURE IS : 29.54 C
THE DELTA T ACROSS THE STACK IS : 31.10 C
THE GUARD TEMPERATURE IS : 45.10 C

=====

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: $3.792624e-001$ W/mK
AND A THERMAL RESISTANCE OF: $2.189385e-003$ m²K/W
AT A TEMPERATURE OF: 75.40 C

0.370 W/mK

THE DELTA T THROUGH THE SAMPLE IS : 19.62 C
THE HEATER TEMPERATURE IS : 54.63 C
THE DELTA T ACROSS THE STACK IS : 30.55 C
THE GUARD TEMPERATURE IS : 72.62 C

=====



DuPont Electronic Laboratory Notebook

Identification Number : D100052-28.01

Experiment Name : D100052-13

Program Name : Zenite

Project Name:Thermoconductivity for Joel Citron

Document Name : D100052-13 series Thermal Conductive Zenite Joel Citron.pdf

Site Name : EXP ST

Business Unit :Engineering Polymers

Author Name : Mike J. Molitor

Date : 02/26/2007 14:59:57

Co-Author Details :

Witness Name : Adcock, Dave

Date : 02/26/2007 15:03:04

Date (GMT)	Signed by
2/26/2007 07:53:57 PM	Name: Mike J. Molitor
	Pre-Sig Hash: 9b9c723fedbb8ec913753be9ac4abcc15c4f0fa1
Justification	By entering your password you verify that you planned and/or executed the work, directed the work, analyzed the result, or drew the conclusions described within this document.

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Justification	By entering your password you will be signing to say that you have witnessed the information contained in this document

	Name:
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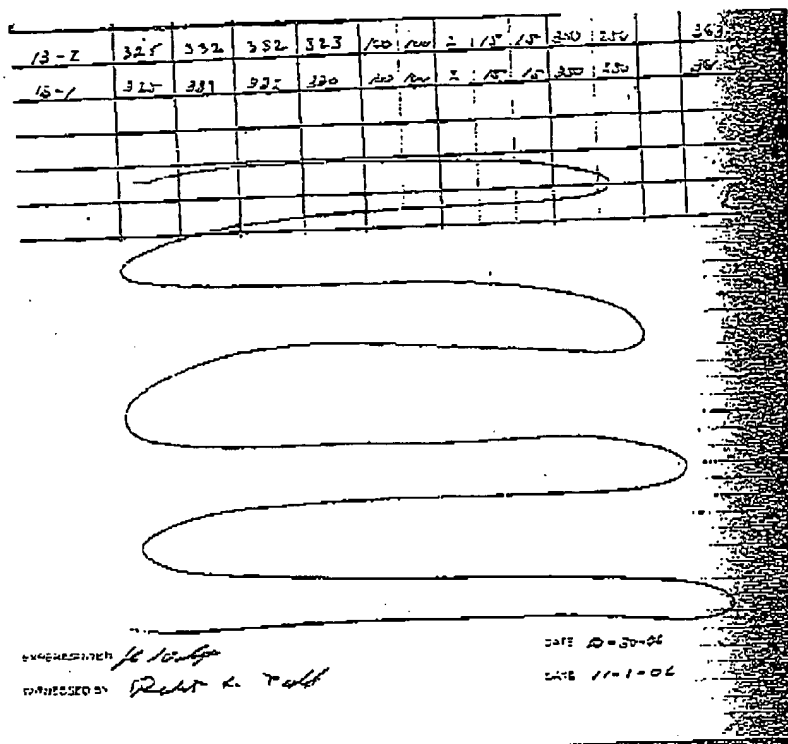
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DuPont Electronic Laboratory Notebook

Identification Number : D100052-28.01

Experiment Name : D100052-13

Program Name : Zenite

Project Name:Thermoconductivity for Joel Citron

Document Name : D100052-13 series Thermal Conductive Zenite Joel Citron.pdf

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Business Unit :Engineering Polymers

Author Name : Mike J. Molitor

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	Pre-Sig Hash: 9b9c723fedbb8ec913753ba9ac4abce15c4f0fal	
Justification	By entering your password you verify that you planned and/or executed the work, directed the work, analyzed the result, or drew the conclusions described within this document.	
2/26/2007 08:03:05 PM	Name: Adcock, Dave	
	Pre-Sig Hash: 40d4778267da1f1aecd9d10dd217ba30817d5b9l	
Justification	By entering your password you will be signing to say that you have witnessed the information contained in this document	
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	Name:	
	Pre-Sig Hash:	
Justification		

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Sample #	13-1	13-2
Zenite 6000	55	
Jetfil Talc 575C	37	
Carbon fiber Sigrasil	8	

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BOOK PAGE E. I. du Pont de Nemours and Company

1547 6 OR A INSPECTION REPORT DATE 10-20-52

E 111598-36 FIVE DGT. MANUAL TESTING

IR NO. 575	NE NO. 2	NO. 52	DATE 10-20-52	CYLINDER 6 02 6
FOR ANALYSIS			CHARACTER 5 A	MAN SPEED 2500
POLYMER TYPE EOLITE			SCREW 6 A	DOWN SPEED -
WOLD 2	WOLD 15-7		NOZZLE 4 200 Y	BACK PRESS 150 LBS

SAMPLING	FEED	CENTER	FRONT	NOZZLE	LOAD TEMP		CYCLE		PRESS TOGETHER	WELL	WELL	100% WELD
					A	B	1	2				
12 2	50 F	352	352	323	200	200	2	15	15	250	250	36



DuPont Electronic Laboratory Notebook

Identification Number : D100008 22.02

Experiment Name : D100002-18

Program Name : Zenith

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Document Name : ThermalConductivityofD100052-13-1and13-2.pdf

Site Name : EXP ST

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Author Name : Adcock, Dave

Date : 02/26/2007 12:57:03

Co-author Details :


Mr. James M. Jones : January, Feb 2.


Date : 02/26/2007 13:07:04


Release Name : Harvey, Pat A. Date : 02/26/2007 13:07:04	
2/26/2007 05:57:04 PM	Name - Aaronk, Nava ecc-buy name: 0a7b049b2d1b7d5a10a54010c2d1350d07b5137d4 By entering your password you verify that you planned and/or executed the work, directed the work, analyzed the result, or draw the conclusions described within this document.

2/26/2007 06:07:04 PM	Name: Harvey, Pat A. Pre-Sig Hash: 73b0cadec1bdeaf8234bdc64d81ea2a301af81ba By entering your password you will be signing to say that you have witnessed the information contained in this document
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	Name:
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	Name:
	Pre-Sig Hash:
	

Signature:	
Pre-Sig Hash:	
	

	Name:
	Pre-Sig Hash:

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TEST DESCRIPTION

100552-13-1

Infection loaded disc

SAMPLE ID: 13-1

SAMPLE THICKNESS: 3.030mm

Average sample temperature = 50.0 C Controller = 30.0 C

TH (C)	TE (C)	TL (C)	TH (C)	TE (C)	Q	RATIO
50.0	48.2	40.2	30.0	19.64	94721	0.231266
50.8	48.0	40.8	29.5	19.75	10096.7	0.195857
50.6	48.1	40.9	29.5	19.73	10107.1	0.195166

Average sample temperature = 75.0 C Controller = 55.0 C

TH (C)	TE (C)	TL (C)	TH (C)	TE (C)	Q	RATIO
75.1	65.8	53.4	49.2	19.74	8854.2	0.233231
95.2	72.0	65.8	54.7	19.63	10181.7	0.193207
85.2	72.0	65.6	54.7	19.62	10167.6	0.193013

USING CALIBRATION FILE: ESI04200.caf
 USING TEST FILE: 13-1.tst

USING FIRST ORDER FIT

SAMPLE ID: 13-1
 SAMPLE THICKNESS: 3.030mm
 CTE: 0.0002400

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: $3.851347 \times 10^{-1} \text{ W/mK}$
 AND A THERMAL RESISTANCE OF: $2.298808 \times 10^{-3} \text{ m}^2/\text{W}$
 AT A TEMPERATURE OF: 50.78 C

0.365 W/mK

THE DELTA T THROUGH THE SAMPLE IS: 19.73 C
 THE HEATER TEMPERATURE IS: 29.54 C
 THE DELTA T ACROSS THE STACK IS: 51.10 C
 THE GUARD TEMPERATURE IS: 48.10 C

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: $3.702624 \times 10^{-1} \text{ W/mK}$
 AND A THERMAL RESISTANCE OF: $2.183855 \times 10^{-3} \text{ m}^2/\text{W}$
 AT A TEMPERATURE OF: 75.46 C

0.370 W/mK

THE DELTA T THROUGH THE SAMPLE IS: 19.62 C
 THE HEATER TEMPERATURE IS: 54.68 C
 THE DELTA T ACROSS THE STACK IS: 50.56 C
 THE GUARD TEMPERATURE IS: 72.02 C

TEST DATA

18-1

18-1

SAMPLE ID: 18-1
 SAMPLE THICKNESS: 3.030mm

Average sample temperature: 30.0 C Controller: 30.0 C

TU (C)	TL (C)	TL (C)	TH (C)	TH - TL (C)	Q	RATIO
60.0	49.2	49.2	30.0	19.64	9472.1	0.211255
60.8	48.0	48.0	29.5	18.75	10086.7	0.195657
60.8	48.1	48.9	29.5	19.73	10107.1	0.198156

Average sample temperature: 55.0 C Controller: 55.0 C

TU (C)	TL (C)	TL (C)	TH (C)	TH - TL (C)	Q	RATIO
78.1	65.9	65.4	49.2	19.74	8654.4	0.233231
85.2	72.0	65.6	54.7	18.63	10181.7	0.193207
85.2	72.0	65.6	54.7	18.62	10167.3	0.193013

USING CALIBRATION FILE: ESI04200.d3
 USING TEST FILE: 18-1.dat

USING FIRST ORDER FIT

SAMPLE ID: 18-1
 SAMPLE THICKNESS: 3.030mm
 CTE: 0.0004000

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: $2.651347e-001$ W/mK
 AND A THERMAL RESISTANCE OF: $2.263209e-003$ m²K/W
 AT A TEMPERATURE OF: 50.78 C

0.365 W/mK

THE DELTA T THROUGH THE SAMPLE IS: 19.73 C
 THE HEATER TEMPERATURE IS: 29.54 C
 THE DELTA T ACROSS THE STACK IS: 31.10 C
 THE GUARD TEMPERATURE IS: 25.10 C

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: $3.702624e-001$ W/mK
 AND A THERMAL RESISTANCE OF: $5.123282e-003$ m²K/W
 AT A TEMPERATURE OF: 75.40 C

0.370 W/mK

THE DELTA T THROUGH THE SAMPLE IS: 19.62 C
 THE HEATER TEMPERATURE IS: 54.66 C
 THE DELTA T ACROSS THE STACK IS: 33.55 C
 THE GUARD TEMPERATURE IS: 72.02 C

TEST DESCRIPTION
 1300522-13-1
 Injection molded disc

SAMPLE ID: 13-1
 SAMPLE THICKNESS: 3.030mm

Average sample temperature = 50.0 C Controller = 50.0 C

TU (C)	TD (C)	TL (C)	TH (C)	TD-TH (C)	Q	RATIO
50.0	48.2	40.4	30.6	19.64	8472.1	0.21266
60.6	48.0	40.8	29.5	19.75	10026.7	0.195857
60.6	48.1	40.9	29.5	19.73	10107.1	0.195156

Average sample temperature = 75.0 C Controller = 55.0 C

TU (C)	TD (C)	TL (C)	TH (C)	TD-TH (C)	Q	RATIO
78.1	65.9	53.4	45.5	18.74	8854.4	0.233231
85.2	72.0	55.6	54.7	19.63	10161.7	0.198207
85.2	72.0	55.6	54.7	19.62	10167.9	0.193013

USING CALIBRATION FILE: ESI04200.cab USING FIRST ORDER FIT
 USING TEST FILE: 13-1.tst
 SAMPLE ID: 13-1
 SAMPLE THICKNESS: 3.030mm
 CTE: 0.00024003

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: $2.551347e-001$ W/mK
 AND A THERMAL RESISTANCE OF: $2.298308e-003$ m²K/W
 AT A TEMPERATURE OF: 50.78 C

0.365 W/mK

THE DELTA T THROUGH THE SAMPLE IS: 19.73 C
 THE HEATER TEMPERATURE IS: 29.64 C
 THE DELTA T ACROSS THE SPACE IS: 31.10 C
 THE GUARD TEMPERATURE IS: 28.10 C

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: $3.702624e-001$ W/mK
 AND A THERMAL RESISTANCE OF: $6.239885e-003$ m²K/W
 AT A TEMPERATURE OF: 75.49 C

0.370 W/mK

THE DELTA T THROUGH THE SAMPLE IS: 19.62 C
 THE HEATER TEMPERATURE IS: 54.66 C
 THE DELTA T ACROSS THE SPACE IS: 30.56 C
 THE GUARD TEMPERATURE IS: 72.02 C